

**SVKM's**  
**D. J. Sanghvi College of Engineering**

**Program: B.Tech in Computer  
Science and Engineering (IOT and  
Cyber Security with Block Chain  
Technology**

**Academic Year: 2022**

**Duration: 3 hours**

**Date: 23.01.2023**

**Time: 09:00 am to 12:00 pm**

**Subject: Database Management Systems (Semester III)**

**Marks: 75**

**Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover page of the Answer Book, which is provided for their use.**

- (1) This question paper contains two pages.
- (2) **All Questions are Compulsory.**
- (3) All questions carry equal marks.
- (4) **Answer to each new question is to be started on a fresh page.**
- (5) **Figures in the brackets on the right indicate full marks.**
- (6) **Assume suitable data wherever required, but justify it.**
- (7) Draw the neat labelled diagrams, wherever necessary.

Question No.		Max. Marks														
Q1 (a)	<p>What is a deadlock? How is it detected? Discuss any two deadlock prevention techniques.</p> <p style="text-align: center;"><b>OR</b></p> <p>What is Conflict serializability? Is the following schedule S serializable? If yes, is it conflict serializable or view serializable?</p> <p style="text-align: center;"><b>Schedule S:</b></p> <table><tr><td><b>T1</b></td><td><b>T2</b></td></tr><tr><td>R(Z)</td><td></td></tr><tr><td>W(Y)</td><td></td></tr><tr><td></td><td>R(Y)</td></tr><tr><td></td><td>W(X)</td></tr><tr><td>W(X)</td><td></td></tr><tr><td></td><td>W(X)</td></tr></table>	<b>T1</b>	<b>T2</b>	R(Z)		W(Y)			R(Y)		W(X)	W(X)			W(X)	<p>[10]</p> <p>[10]</p>
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Q1 (b)	Define DBA. Differentiate Physical and Logical Data Independence.	[05]														
Q2 (a)	Construct an EER Diagram for following problem statement: Consider a Conference Management System in which authors submit their research papers for consideration under two categories as undergraduate and post graduate. One author can submit at most two papers. All papers must be reviewed before selection. Reviewers evaluate the papers and make recommendation regarding whether to accept or reject the papers.	[10]														
Q2 (b)	Convert any 2 entities, 2 relationships and 1 EER feature from above ER diagram into Relational Model.	[05]														

Q3 (a)	<p>Consider following relations and write SQL queries for given query statements.</p> <p><b>Employee</b> (<u>Eno</u>, name, addr, qualification, course_id, dept, designation, joining_date)</p> <p><b>Accounts</b> (<u>Acct_no</u>, Eno, basic_sal, DA, HRA, PF, gross_sal)</p> <p>i) Add new column 'birth_date' in employee table.  ii) Find all employees whose salary is greater than or equal to Allen's salary.  iii) Modify database to reflect that 'Allen' is promoted to Manager from 'Engineer'.  iv) Display list of employees according to their gross salary.</p> <p style="text-align: center;"><b>OR</b></p> <p>Describe any FIVE terms from following,</p> <ol style="list-style-type: none"> <li>Full Outer Join</li> <li>SUM and MIN</li> <li>Group by</li> <li>Order by</li> <li>Sub Query</li> <li>LIKE</li> </ol>	[10]
Q3 (b)	Explain Integrity Constraints in SQL.	[05]
Q4 (a)	<p>Why do we need normalization? Explain 1NF, 2NF and 3NF with example.</p> <p style="text-align: center;"><b>OR</b></p> <p>Normalize the following table upto 3NF.</p> <p>Building_info (<u>elevator_no</u>, <u>staff_no</u>, building_no, building_name, capacity, first_name, last_name, date_examined) with the following functional dependencies:</p> <ol style="list-style-type: none"> <li>elevator_no → building_no, capacity</li> <li>building_no → building_name</li> <li>staff_no → first_name, last_name</li> <li>elevator_no, staff_no → date_examined</li> </ol>	[10]
Q4 (b)	Explain any two anomalies resolved by Normalization with the help of suitable example.	[05]
Q5 (a)	<p>Write short note on,</p> <ol style="list-style-type: none"> <li>Rocksdb</li> <li>SQL vs NoSQL</li> </ol> <p style="text-align: center;"><b>OR</b></p> <p>Explain following operations in MongoDB,</p> <ol style="list-style-type: none"> <li>Create</li> <li>Read</li> <li>Update</li> <li>Delete</li> </ol>	[10]
Q5 (b)	Draw and explain state transition diagram of transaction.	[05]

All the Best!